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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,026	12/28/2001	Janardhanan Anand Subramony	006333	2626

32588 7590 08/21/2003

APPLIED MATERIALS, INC.
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EXAMINER

MEEKS, TIMOTHY HOWARD

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 08/21/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/041,026

Applicant(s)

SUBRAMONY ET AL.

Examiner

Timothy H. Weeks

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4,6-8,10-13,15-23,25 and 28-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-23,25 and 28-31 is/are allowed.
- 6) ☒ Claim(s) 2-4,6-8,10-13 and 15-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6, 8. 6) ☐ Other: _____

DETAILED ACTION

Application Status

The amendment filed on 24 June 2003 in response to the Office Action mailed on 19 March 2003 has been fully considered. In the amendment, claims 2-4, 6-8, 10-13, 15-20, 22, 23, and 25 were amended, claims 28-31 were added, and claims 1, 5, 9, 14, 24, 26, and 27 were canceled. Claims 2-4, 6-8, 10-13, 15-20, 22, 23, 25, and 28-31 are pending.

Withdrawn Rejections/Objections

The following rejections and objections set forth in the previous action are withdrawn in view amendments made by applicants:

- Claims 2, 4, 6-8, 11, 13, 16, 20, 22, and 23 under 35 USC 112, second paragraph;
- Objection to claims 19 and 25;
- Claims 1, 3-5, 7-10, 12-15, 17, and 18 under 35 USC 102(e) over Jain;
- Claims 9-13 under 35 USC 102(b) over Adams; and
- Claims 9-12 under 35 USC 102(b) over Yoshioka.

Rejections Being Maintained

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Adams (4,217,375).

The claimed process is explicitly disclosed at Example 1. Please note that claim 6 a "single deposition chamber" and the substrate of Adams is clearly placed in only one deposition chamber. If applicants insert the word "wafer" after "single" this rejection will be withdrawn.

Claims 6, 7 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshioka et al. (3,442,700).

The claimed process is disclosed at col. 3, lines 40-45 and col. 3, line 63 to col. 4, line 15. The 1,000 times flow ratio is in the claimed range. As shown in the figures, the silicon and oxidation sources are mixed prior to the decomposition.

Claims 2, 3 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al.

The teachings of Yoshioka are discussed above. Yoshioka is silent as to the pressure under which deposition is conducted and therefore fails to disclose the claimed pressures. However, it has been well established that "Where the principal difference between the claimed process and that taught by the reference is a temperature difference, it is incumbent upon applicant to establish criticality of that difference". See *Ex parte Khusid*, 174 USPQ 59. In the instant case, the only difference between the prior art and the claimed process is the process pressure which is clearly analogous to a temperature difference. If applicant can establish a showing of criticality in the claimed pressure, the rejection will be withdrawn.

New Rejections Necessitated by Amendments

Claims 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Takagi (5,445,676).

Takagi discloses a process comprising placing a wafer in a single deposition chamber (see abstract and col. 11, lines 47-54 where processing of a single wafer is disclosed, therefore the Takagi chamber constitutes a "single wafer deposition chamber"), decomposing silane and

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N₂O gases using a thermal source in the deposition chamber to form a SiO₂ film on the wafer and annealing the wafer (heater 15 in Fig 6, col. 4, lines 28-40). Please note that heating the wafer to 850 °C while supplying silane and N₂O to form SiO₂ constitutes a thermal annealing of the substrate and likewise meets the limitations of claim 10 requiring same Si and oxidation gases as used in depositing.

Claims 2-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi.

The teachings of Takagi are discussed above. With respect to claims 2-4, Takagi is silent as to the pressure under which deposition is conducted and therefore fails to disclose the claimed pressures. With respect to claims 6-8, Takagi is silent as to the ratio of oxidation to silicon source gases and therefore fails to disclose the claimed ratios. However, it has been well established that "Where the principal difference between the claimed process and that taught by the reference is a temperature difference, it is incumbent upon applicant to establish criticality of that difference". See *Ex parte Khusid*, 174 USPQ 59. In the instant case, the only difference between the prior art and the claimed process is the process pressure or ratio of reactants which are clearly analogous to a temperature difference. If applicant can establish a showing of criticality in the claimed pressure and ratios, the rejection will be withdrawn.

Claims 4, 8, 13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka in view of Kholodenko et al. (6,185,839).

Yoshioka discloses reaction with H₂O oxidation gas rather than the oxidizers of claims 4, 8, 13, and 18. However, because Kholodenko discloses that H₂O and N₂O are recognized as both functioning as oxidizers for oxidation of silicon source gases to form SiO₂ films (col. 7, lines 45-50), it would have been obvious to use the N₂O oxidizer with a reasonable expectation of its effectively oxidizing the silicon source gas to form SiO₂.

Allowable Subject Matter

Claims 19-23, 25, and 28-31 are allowed.

Response to Arguments

Applicant's arguments filed 24 June 2003 have been fully considered but they are not persuasive.

Applicants argue that Adams discloses a batch reactor rather than a single wafer deposition chamber. However, as set forth above, this limitation does not appear in claim 6.

Applicants argue that the Yoshioka ratio requires more silicon source than oxidation gas. Yoshioka clearly states an amount of steam (oxidation gas) 20-1,000 times the silicon fluoride amount is used (col. 1, lines 24-25). The ratio of 1,000:1 steam:SiF₄ falls in the claimed range.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

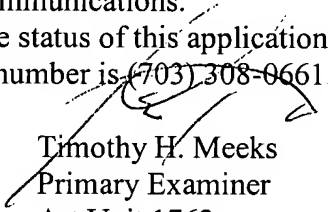
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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy H. Meeks whose telephone number is (703) 308-3816. The examiner can normally be reached on Mon., Tues., Thurs.(6-6:30), Fri.(6:30-10:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Timothy H. Meeks
Primary Examiner
Art Unit 1762

final
August 11, 2003